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brackish water, partly on low-lying soil which is rarely, sometimes never, covered by salt or brackish water.

While visiting the islands in 1906, he noted that the extensive mangrove forest occupying one of the larger lagoons had perished. The explanation seems to be that in 1899 the island was ravaged by a serious hurricane, which so violently agitated the sea that large quantities of clay and gravel were washed into the lagoon and deposited as a layer several inches thick. This caused so sudden a change in the soil constitution as to destroy the forest, although there were clear indications that the same formation would eventually reclaim much of the area formerly occupied.

The small trees growing in drier situations seem sufficiently distinct from the mangroves to be regarded as a distinct society, which is named the "Conocarpus formation," after the most conspicuous member. This formation is regarded as very nearly the ecological equivalent of the Nipa formation of SCHIMPER in the Indo-Malayan strand flora. The vegetation of the sand strand exposed to the wind includes the well-known Pes-caprae formation, an aggregation of shrubs designated the Tournefortia formation, and the forest Coccoloba-Manchineel formation. The anatomy of several of the strand plants has been investigated, and some further studies made of the more xerophytic vegetation of the rocky coasts.—GEO. D. FULLER.

Loess and plant societies.—The intimate relation between physiographic plant ecology and geology receives emphasis in the evidence deduced by SHIMEK[30] to prove that the irregular distribution of loess deposits has been effected by the character of formerly existing plant societies. Vegetation is known to play an important part in pulverizing the soil, affording anchorage for fine wind-blown particles, and finally in returning its own substance to the soil in a finely subdivided condition. Thus well-drained areas supporting heavy mesophytic vegetation accumulated fine material now appearing as moderate deposits of loess of uniform quality. Xerophytic societies of unequal density resulted in inequality and irregularity of the deposits, while hydrophytic areas, as well as those of such elevation or aridity as to be without vegetation, collected no loess. The very diverse aspect of the plant societies on the east and west sides of large streams like the Mississippi is found to correspond exactly with the difference in quality and distribution of their loess deposits. The interstratification of sand the author believes to have resulted from periods of very scanty vegetation caused by climatic changes.

While the thesis is essentially an argument in support of the eolian hypothesis for the formation of loess, it has many points of interest for the ecologist; for should further evidence prove the soundness of the author's views, it would afford a useful key to the distribution of plant societies during recent geologic times. The author finds the present edaphic influence of loess evident in the vegetation, even where the surface overwash has hidden the character of the substratum. The forest on the loess is dominated by *Quercus alba* and *Q. ruba*, while the adjacent sandy areas are covered by the more xerophytic *Q. velutina* and *Q. macrocarpa*.—GEO. D. FULLER.

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[30] SHIMEK, B., The genesis of loess a problem in plant ecology. Proc. Iowa Acad. Sci. **15**:57–74. *pls. 3–7.* 1909.

Air chambers of Ricciaceae.—Miss HIRSH,[31] under the direction of Dr. E. J. DURAND, has examined a number of species of Riccia to determine the correctness of the statement of BARNES and LAND that the air chambers of Marchantiales arise invariably by the splitting of internal walls. She finds that in the Ricciaceae the statement is true only for *Riccia natans* and *Riccia fluitans*, and that in all other species which she examined the air chambers arise according to the method described by LEITGEB, and cites as proof three figures of *Riccia Frostii*. To critical students of the group these figures do not furnish conclusive evidence one way or the other, for they are made in such a manner that the relation to each other of the rows of the cells back of the growing point cannot be made out with any certainty. In *fig. 4* of *Riccia Frostii* the first air chambers can as easily be interpreted as having split from within the thallus and having just reached the surface, as that the cells have become papillate. In fact, the contour of the section drawn seems to show that all the filaments actually originated by splitting and intercalary growth. The same is true in a more marked degree of *fig. 5*, and less so of *fig. 6*. In the latter figure the arching of the superficial cells due to turgor is interpreted by Miss HIRSH as the beginning of the papillate outgrowths of LEITGEB. Such investigations should be preceded by a careful study of the development of the thallus from the growing point, and there should be a clear conception of the arrangement of the cells which result from this growing point. While the style of the drawings is admirable, the position of cells and cell walls shows that such study must have been neglected in this case.—W. J. G. LAND.

Light and germination.—KINZEL[32] has devised apparatus that answers all objections to his former methods, which indicated that light favored or was even necessary for the germination of various seeds. Both illuminated and darkened after-ripened seeds of *Veronica Anagallis* were kept in germinators at a constant temperature of 16°7 C. Within a week 100 per cent of the illuminated cultures had germinated, while none of the darkened ones grew even after three months. He lists 63 species that germinate only in light, of which the following are examples: *Scheuchzeria palustris*, *Luzula albida*, *Thalictrum angustifolium*, *T. aquilegiifolium*, *Drosera rotundifolia*, *D. anglica*, *D. intermedia*, *Primula pubescens*, *P. spectabilis*, *Verbascum Thapsus*, *V. nigrum*, *Mimulus luteus*, *Veronica Anagallis*, and *Campanula rotundifolia*. He does not state whether high temperatures will dispose of the necessity of light, as is the case with various fern spores. It also

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[31] HIRSH, PAULINE E., The development of air chambers in the Ricciaceae. Bull. Torr. Bot. Club **37**:73–77. *figs. 6.* 1910.

[32] KINZEL, W., Lichtkeimung: Erläuterungen und Ergänzungen. Ber. Deutsch. Bot. Gesell. **27**:536–545. *pl. 19.* 1909.